<u>Claims</u>

What is claimed is:

1.   A method for analyzing a sample containing particles to detect and characterize target particles having a plurality of detectable characteristics in a fixed

5   volume capillary that contains a fluorescent background and which exhibits background characteristics, the method comprising:

(a)   scanning the fixed volume capillary containing the sample to generate a plurality of channels of data, wherein each channel of data comprises a distinct

10   detectable characteristic and a distinct background characteristic;

(b)   sampling each of the channels of data to produce corresponding sets of pixel values;

15   (c)   generating sets of enhanced pixel values by independently modifying each set of pixel values to selectively enhance spatial features that are indicative of a target particle;

(d)   removing from one or more sets of enhanced pixel values the distinct

20   background characteristic for the corresponding channel;

(e)   independently establishing noise threshold values for the detection of said particles for each set of enhanced pixel values;

25   (g)   independently identifying, in each set of enhanced pixel values, groups of above-threshold pixels located in patterns that are diagnostic of said particles;

(h)   independently identifying, for each group of above-threshold pixels located in a diagnostic pattern in a particular set of enhanced pixel values, the

corresponding below-threshold or at-threshold pixels in the remaining sets of enhanced pixel values; and

(i)   characterizing the target particles in the sample by analyzing the pixels
5   independently identified in steps (g) and (h);

whereby particles are initially identified and analyzed in channels with above-threshold pixels located in patterns diagnostic of said particles, and said particles are then independently analyzed in all remaining channels by locating pixels in the same
10   positions as the above-threshold pixels initially identified.

2.   In a method for analyzing a sample containing particles to detect and characterize target particles having a plurality of detectable characteristics in a fixed volume capillary that contains a fluorescent background and which exhibits
15   background characteristics, the method comprising:

(a)   scanning the fixed volume capillary containing the sample to generate a plurality of channels of data, wherein each channel of data comprises a distinct detectable characteristic and a distinct background characteristic;
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(b)   sampling each of the channels of data to produce corresponding sets of source pixel values;

(c)   summing the sets of source pixel values to generate a composite
25   image;

(d)   calculating a threshold for particle detection in said composite image;

(e)   performing particle detection in said composite image using said
30   threshold;

(f)   identifying, for each particle identified in said composite image, the corresponding pixels in the sets of source pixel values; and

5   (g)   analyzing the pixels identified in step (f);

the improvement comprising:

(i)   calculating the threshold for particle detection independently in each set of source pixel values;

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(ii)   performing particle detection independently in each set of source pixel values using the corresponding threshold; and

15   (iii)   identifying, for each particle identified in a particular set of source pixel values in step (2), the corresponding pixels in the remaining sets of source pixel values; and

(iv)   analyzing the pixels identified in steps (2) and (3).

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3.   In a method for analyzing a sample containing particles to detect target particles having a plurality of detectable characteristics in a fixed volume capillary that contains a fluorescent background and which exhibits background characteristics, the method comprising;

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(a)   scanning the fixed volume capillary containing the sample to generate a plurality of channels of data, wherein each channel of data comprises a distinct detectable characteristic and a distinct background characteristic;

(b)   sampling each of the channels of data to produce corresponding sets of source pixel values;

(c)   summing the sets of source pixel values to generate a composite

5   image;

(d)   calculating a threshold for particle detection in said composite image;

(e)   performing particle detection in said composite image using said

10   threshold;

the improvement comprising:

(i)   calculating the threshold for particle detection independently in each set of source pixel values without first summing the source images; and

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(ii)   performing particle detection independently in each set of source pixel values using the corresponding threshold.